Abstract of the Disclosure

A method and apparatus for processing Ethernet data frames in a media access control (MAC) sublayer of an Ethernet passive optical network (PON) are provided. The apparatus for processing protocol layers of an Ethernet passive optical network (PON) includes: an Emulation sublayer processing unit which performs cyclic redundancy check (CRC) on information included in a preamble of an Ethernet data frame transferred from a physical layer processing unit, and extracts LLIDs from the preamble; a MAC sublayer processing unit, which has one MAC address corresponding to multiple LLID indexes corresponding to the extracted LLIDs, to perform control and management; a MAC control sublayer processing unit which contains information of the multiple LLID indexes, and performs MAC control on each LLID index; a PON bridge sublayer processing unit which performs a bridge function of the Ethernet PON and tag management of the Ethernet PON; and an Emulated-MAC sublayer processing unit which performs upstream and downstream Ethernet data frame matching, FCS error checking, and PAUSE frame processing. Therefore, an effect exists in that when processing the Ethernet frames, an interface suited to the Ethernet PON system is provided.